NIH Blue Ribbon Panel to Advise on the Risk Assessment for the BU National Emerging Infectious Disease Laboratories

Teleconference with the National Research Council on Technical Input

April 7, 2009

11:00 AM – 1:00 PM

Today's Agenda

11:00 AM Welcome and Roundtable Introductions

11:15 AM Supplementary Risk Assessment: Charting the Course Forward

- Review of NIH Blue Ribbon Panel's Charge and Task
- Supplementary Risk Assessment: Study Design, Agents, Scenarios, and Methodology
- Next Steps

11:45 AM Questions and Discussion

12:45 PM Public Comment

1:00 PM Adjourn

NIH Blue Ribbon Panel: Purpose

- **To provide scientific and technical advice to the NIH regarding the construction and operation of a national biocontainment laboratory at Boston University Medical Center**
  - **Comments and concerns have been voiced by:**
    - **Courts**
    - **Local community**
    - **General public**

Two-Fold Charge to the Panel

- **BRP to Advise on:**

  - **Studies to assess any potential public health risks associated with the operation of the NEIDL and assess strategies for mitigating these risks**

  - **Strategies to enhance local community relations and communications regarding national and regional biocontainment laboratories**

Phase I Tasks

- Determine what additional studies are needed to assess potential risks and public health consequences of:
  - Accidental and malevolent releases of infectious agents
  - Exposure to infectious agents in urban versus less populated locations
- Define the key elements of studies:
  - Infectious agents
  - Scenarios
  - Methodologies
- Address underlying concept of "worst case"

Panel's Approach

- **Reviewed background materials:**
  - **Previous studies**
  - **Public input**
  - **Judicial materials**
  - **Epidemiologic and demographic data**
  - **Safety and emergency preparedness plans**
- **To further inform the Panel's analysis, the NIH commissioned the NRC to suggest approaches to risk assessment**

NIH Requests Input from NRC

- **The NRC Committee met with the BRP on May 2, 2008 to:**
  - **"…discuss in more detail the Committee's concerns about the DSRASSA"**
  - **"…provide in writing its views on approaches to be taken and issues to be addressed to improve any subsequent risk analyses that may be undertaken."**
  - **"…provide input on analytical approaches, risk assessment methodologies, and particular scenarios that the NIH could include in its work plan to address judicial requests and public concerns about risks associated with the siting and operation of the NEIDL."**

NRC Overarching Findings

- NRC specific conclusions were consistent with the Panel's, validating its emerging findings
- The NRC report noted that:
  - BSL-4 facilities have been operated safely in both urban and rural settings
  - Selection of sites for high-containment labs should be supported by detailed analyses and transparent communication of information regarding possible risks

NRC Recommendations

- Instead of focusing on worst-case scenarios, two phases of analysis were suggested:
  - Plausible scenarios designed to allow a realistic assessment of risks
  - Credible high-consequence event for assessment
- Potential agent release and probability statements should consider:
  - Procedural or work-practice failures, including those that lead to worker exposures and infections
  - Biocontainment-system and equipment failures
  - Appropriate array of malevolent actions

NRC Recommendations (Cont'd)

- A variety of agents should be selected for assessment with appropriately diverse transmission characteristics (bloodborne, transmitted on fomites, spread by aerosol, and/or requiring vectors and the potential for maintenance in existing reservoir species)
- The risk assessment should address portal of entry into the host, aspects of transmission as high or low R_0, latency, and incubation periods
- It might be helpful to clarify for the public and courts, what agents and forms of agents will *not* be researched at the NEIDL (e.g. virus that causes small pox)

NRC Recommendations (Cont'd)

- **A risk assessment should begin with the following four outcomes and assess how the characteristics of agents studied in the NEIDL might influence the likelihood of each outcome in the event of a release:**
  - **No subsequent transmission, following a small initial pool of infection**
  - **Little or no subsequent transmission, following multiple exposures**
  - **Limited transmission that is contained by public health measures**
  - **Amplified transmission**
- **Qualitative analysis of potential outcomes should consider impact of local characteristics (e.g. population density, vector availability, public health infrastructure) on the probability of the various outcomes**

NRC Recommendations (Cont'd)

- Mathematical modeling must be done transparently, credibly, and to professional standards by experienced epidemiological modelers and microbial risk assessors
- Any modeling exercise should be accompanied by thorough uncertainty and sensitivity analysis
- Community characteristics (e.g. racial, ethnic, and socioeconomic) should be taken into account
- NIH should improve communication with the community about the risk assessment

Blue Ribbon Panel Meetings

- **March 13, 2008 (Bethesda)**
  - Discussed overarching aims and the scope of relevant research
  - Invited federal, state, and municipal officials presented on pertinent research oversight requirements
  - NIH presented an overview regarding legal proceedings
  - NIH presented an overview of the 2007draft supplementary risk assessment
- **May 2, 2008 (Bethesda)**
  - Invited the NRC to present their "Letter Report Regarding the Strategies to Address Issues Concerning the 2007 Draft Supplementary Risk Assessments and Site Suitability Analysis for the NEIDL"
  - NRC provided additional input regarding the design and development of a subsequent risk assessment

Blue Ribbon Panel Meetings (cont'd)

- **May 16, 2008 (Boston)**
  - Presented the BRP charge and proposed approach to supplementary risk assessment
- **June 6, 2008 (Bethesda)**
  - Presented BRP recommendations to the ACD regarding agents, scenarios, and methodology for a supplementary risk assessment
- **July 16, 2008 (Bethesda)**
  - Invited members of Boston community, Boston city officials, community researchers, and social justice advocates
  - Explored case studies on community engagements and environmental justice
  - Roundtable discussion of how to effectively engage communities

Blue Ribbon Panel Meetings (cont'd)

- **October 14, 2008 (Boston)**
  - Engaged community members in planning of meeting and outreach efforts
  - Evening meeting in local community hall to:
    - Present and seek community input on draft principles and best practices for community engagement
    - Hear general comments and perspectives from community members
- **December 5, 2008 (Bethesda)**
  - Provided a progress update to the ACD regarding the development of a subsequent risk assessment and BRP activities regarding community engagement

Phase I: Overarching Recommendations from Blue Ribbon Panel

- **Additional studies should be performed to address judicial requests and public concerns:**
  - **Use proven methods and reflect known epidemiologic data**
  - **Clearly describe methods, sensitivity of methods, assumptions, final results, and interpretation of results**
  - **Take into account characteristics of the surrounding communities**

Agents for Study

Agents for Study: Key Attributes

- **Intrinsic agent attributes:**
  - Infectivity (primary infection rate, primary routes of human infection)
  - Transmissibility (including secondary and tertiary transmission)
  - Incubation period
  - Infection period
  - Pathogenicity
  - Mortality rate
  - Reservoirs (if known)
  - Vectors (if known)
  - Availability and efficacy of treatments

Agents for Study: Key Attributes

- **Extrinsic attributes:**
  - Relevance to the site locations (actual and alternatives), especially in terms of reservoirs and vectors
  - Extent of epidemiologic data
  - Availability of sound models for a given infectious disease

- **Degree to which an agent is recognized as a public health concern and/or studied at the NEDIL**
  - For example, designation as
    - BSL-3 Agent
    - BSL-4 Agent
    - Category A Agent
    - Select Agent

Recommendation: Comprehensive Range of Agents

- **Agents to be studied should include those that are:**
  - **Highly transmissible, highly pathogenic, and higher case fatality rate**
  - **Highly transmissible, pathogenic, and lower case fatality rate**
  - **Poorly transmissible but highly pathogenic, and higher case fatality rate**
  - **Vector-borne and relevant to the sites to be assessed**

Recommendation: Agents for Study

- **Risk assessments should be done for the following agents:**
  - 1918 pandemic influenza virus
  - *Yersinia pestis*
  - *Francisella tularensis*
  - *Bacillus anthracis*
  - SARS-associated coronavirus

  BSL 3

  - Rift Valley fever virus
  - Andes hantavirus

  BSL 3 or 4

  - Junin haemorrhagic fever virus
  - Tick-borne encephalitis complex (Russian spring-summer encephalitis) virus
  - Lassa fever virus
  - Marburg virus
  - Ebola virus
  - Nipah virus (*added at the request of BU*)

  BSL 4

NOTE: Agents in RED are CDC and/or NIH Category A Agents and/or Select Agents

How Do the Recommended Agents Track to Judicial, State, NRC, and Public Requests/Recommendations?

Requested/Recommended Agent Attributes	Source of Request/Recommendation	Included
Category A	Federal Court	√
Biosafety Level 4 Agents	Federal Court	√
Highly contagious	State Agency Public	√
Agents with R_0 >1	NRC Committee	√
Agents with different latencies and infectious periods	NRC Committee	√
Transmission via aerosol, fomites	NRC Committee Public	√ (aerosol)
Blood-borne	NRC Committee	√
Vector-borne with urban reservoir	NRC Committee Public	√
Potential for maintenance in existing reservoir species	NRC Committee	√
Novel or poorly characterized pathogens	NRC Committee	√
Genetically modified agents	NRC Committee Public	√

Scenarios for Study

Recommendation: Scenarios

- **Scenarios should:**
  - Be scientifically accurate and credible
  - Be realistic
    - Relate to a real case if possible
    - Include agents that are recognized as a public health concern
    - Include releases of infectious agents into the community that are representative of what could occur through:
      - Accidental release
      - Malevolent action

Recommendation: "Worst Case" Scenarios

- State court requested evaluation of "worst case" scenario that involves "risk of contagion arising from accidental or malevolent release of a contagious pathogen."
  - Concept of "worst case"
    - Intuitively understood but highly subjective notion
      - Therefore "worst case" is a discredited term in the field of risk assessment (e.g., nuclear reactor safety)*
  - Variations of the scenarios will address underlying concept: "highly unlikely but still credible high consequence event" *

*Note: NRC Report, May 2008

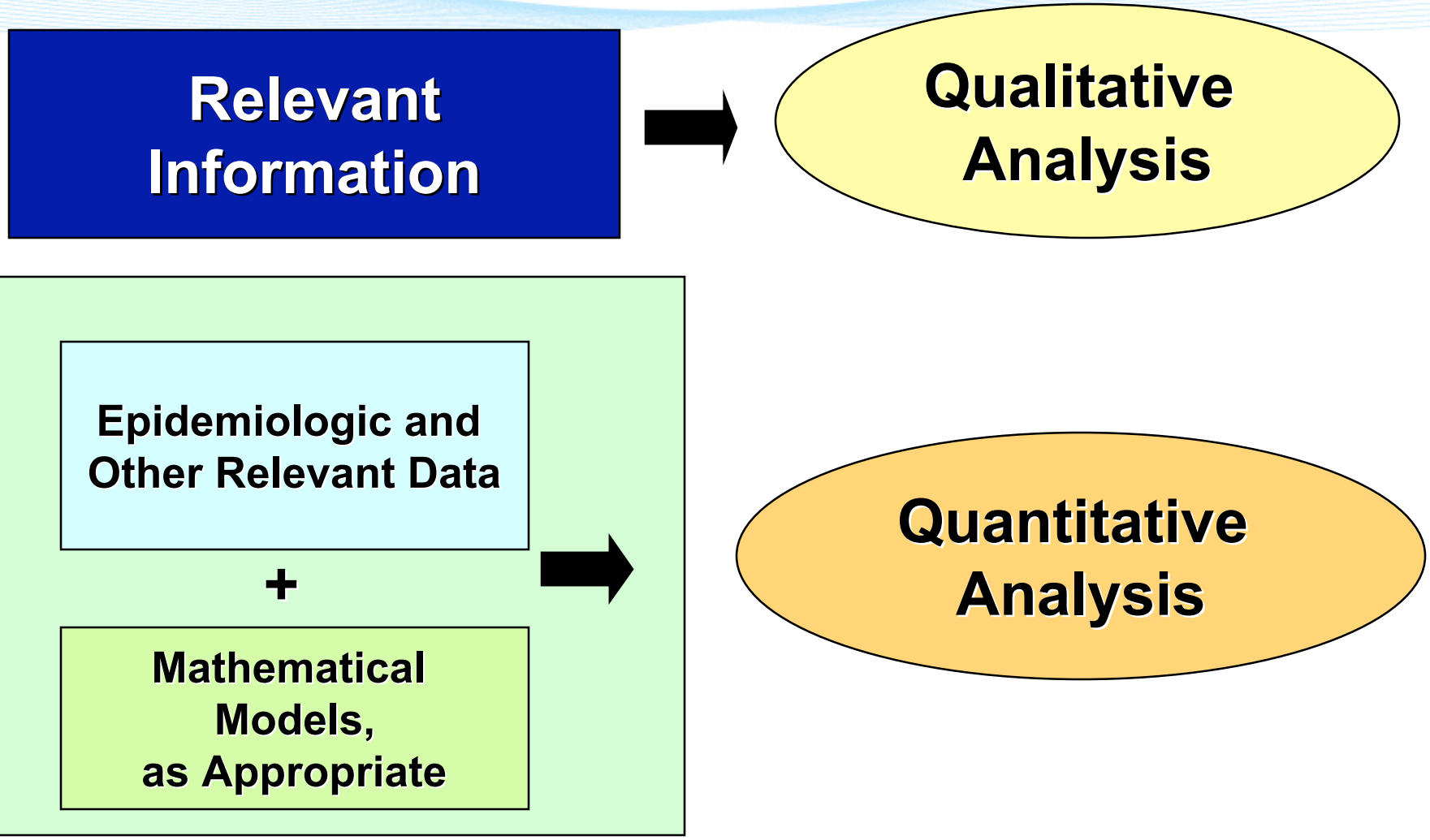
Type of Scenario	Examples	Sources
Mechanical or Power Failure	Lab Equipment failure	NRC
	Loss of power	Public
	Malfunction of solid and liquid waste disposal systems	Public
Transportation Accident	Transportation Accident	Federal Court, Public
Security Failure	Site security failure	NRC
	Personnel security failure	NRC
Exposure via Fomites or release of Vectors	Fomites bearing transmissible agents	Public
	Vector-borne agent release	NRC, Public
Human Errors	Procedural errors resulting in inadvertent infection (e.g., mislabeled tubes)	NRC, Public
	Infection not diagnosed early and spreads in community, esp. via public transportation	Public
Malevolent Actions	Malevolent actions	NRC, State Court, Public
	Suicide bomber/airplane attack/truck with explosives/fire	Public
	Disgruntled or deranged lab worker spreads agents in community	Public

Methodology and Analyses

Recommendation: Analyses

- **Qualitative analyses:**
  - **Should be conducted for all agents and scenarios**
- **Quantitative analyses:**
  - **Should also be performed in all cases for which sufficient epidemiologic data and validated mathematical models are available**
- **Analyses should:**
  - **Use proven methods and reflect known epidemiologic data**
  - **Take into account characteristics of the surrounding community**
  - **Be transparent regarding any assumptions and sensitivity of analyses**

Methodologies to Assess Consequences of a Release/Exposure Event



Recommendation: Analyses

- **Analyses should address:**
  - **Risk of agent release**
  - **Probability of occurrence**
  - **Any uncertainty in critical parameters used**
  - **For any value selected for use, the range of published values**
  - **Available public health interventions**
  - **Comparative risks at urban, suburban, and rural sites**
  - **What happens when safety measures and emergency plans do and don't work**

Update on Supplementary Risk Assessment

- Contract awarded in September 2008
- Broad range of infectious agents and scenarios
- Ongoing oversight of study by the Blue Ribbon Panel
- Transparent process for development of risk assessment to include public meetings at key milestones and public comment

NIH Convenes the NRC for Input into the Development of the Supplementary Risk Assessment

- **Statement of Task**
  - **"… the NRC will address whether the supplementary risk assessment is scientifically and technically sound in general and whether it addresses the public health concerns previously raised by the NRC in its review of the July 2007 DSRASSA"**

Schedule of NRC/BRP Meetings

- **April 7, 2009**
  - Administrative teleconference with the BRP Chair and members of the NRC
- **May 5, 2009**
  - Public meeting of the NRC and the BRP to review 25% draft risk assessment
- **Late August/Early September 2009**
  - Public meeting of the NRC and the BRP to review 75% draft risk assessment
- **Fall 2009**
  - Public meeting of the NRC and the BRP to review 89% draft risk assessment before it is released for public comment
- **Winter 2009/2010**
  - Provide comment for the public record on the 90% draft risk assessment

Immediate Next Steps

- NRC/BRP discussion of the 25% draft Risk Assessment on May 5, 2009
  - NIH Campus, Building 31, Conference Room 6
- Major topics included in the 25% risk assessment:
  - Identification of Potential Analytic Methods, Models, and Assumptions
  - Identification and Evaluation of Candidate Hazard/Accident/Security Scenarios
  - Selection of proposed scenarios for detailed analysis

Questions and Discussion

Public Comment